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| APPLICATION NO.                                                                  | FILING DATE | FIRST NAMED INVENTOR   | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|----------------------------------------------------------------------------------|-------------|------------------------|---------------------|------------------|
| 09/977,875                                                                       | 10/15/2001  | Christopher D. Eckhoff | 75622.P0048         | 3782             |
| 7590                                                                             | 10/18/2006  |                        | EXAMINER            |                  |
| William D. Davis<br>Davis & Associates<br>Box 1093<br>Dripping Springs, TX 78620 |             |                        | JAMAL, ALEXANDER    |                  |
|                                                                                  |             |                        | ART UNIT            | PAPER NUMBER     |
|                                                                                  |             |                        |                     | 2614             |

DATE MAILED: 10/18/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

|                              |                        |                     |  |
|------------------------------|------------------------|---------------------|--|
| <b>Office Action Summary</b> | <b>Application No.</b> | <b>Applicant(s)</b> |  |
|                              | 09/977,875             | ECKHOFF ET AL.      |  |
|                              | <b>Examiner</b>        | <b>Art Unit</b>     |  |
|                              | Alexander Jamal        | 2614                |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 23 August 2006.
- 2a) This action is FINAL.                    2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) \_\_\_\_\_ is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1-16 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) All    b) Some \* c) None of:
  1. Certified copies of the priority documents have been received.
  2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |                                                                                      |                                                                   |
|--------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date. _____                                                         | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### ***Response to Amendment***

1. Based upon the submitted amendment, the examiner notes that claims 1,6 and 13 have been amended.
2. Examiner maintains the previous set of rejections and responds to applicant's arguments.
3. Examiner additionally notes newly discovered prior art patent to Ortel (6157716), which also teaches the use of hysteresis in SLIC loop current detection/switching.

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. **Claims 1,2,13,** rejected under 35 U.S.C. 103(a) as being unpatentable over Apfel (5619567) and further in view of Ludeman (6665398).

As per **claim 1**, Apfel discloses a variable DC feed characteristic for a SLIC that switches from a normal mode 401 to a modified mode 402 DC feed (Fig. 4). The normal mode is switched to the modified mode when Vab is less than or equal to threshold B.

The mode is switched back to the normal mode at threshold E. Apfel discloses that mode is switched (from either on-hook to off-hook or off-hook to on-hook) based upon a hook switch threshold (points E and B in Fig. 4). However, Apfel does not disclose that the switching occurs occurs at two distinct loop currents (Apfel only has one switching threshold).

Ludeman discloses a SLIC that provides a ‘threshold window’ 100 (Fig. 4) that comprises two distinct switching points Ish- and Ish+ to begin the switching from onhook to offhook and from offhook to onhook. The points are set based upon a programmable threshold value (Col 5 lines 10-30). Ludeman discloses that prior art systems such as that shown in Fig. 2 rely on single switching thresholds are unstable around the transition point because of the speed of change (Col 2 lines 10-25), and teaches that his inventive system overcomes the drawbacks of the prior art (Col 2 lines 50-55). It would have been obvious to one of ordinary skill in the art at the time of this application to have two distinct switching points B and E in Fig. 4 of Apfel for the purpose of providing a longer, and more stable transition.

As per **claim 13**, it is rejected for the same reasons as the claim 1 rejection.

As per **claim 2**, curve 401 (APFEL: Fig. 4) is linear, defined by VBAT-Voff1, and has a slope corresponding to an impedance.

6. **Claims 3-5,14,16** rejected under 35 U.S.C. 103(a) as being unpatentable over Apfel (5619567) in view of Ludeman (6665398) as applied to claims 1,13.

As per **claims 3,14,16**, Apfel uses an open circuit voltage value (VBAT-Voff1), two relative thresholds (B,E), and a target voltage (VBAT-Voff3) to define linear portions 401,402. However Apfel does not specify using a target open circuit voltage in defining the load line.

Since the impedance (slope) of the modified characteristic (402 in Fig. 4) is the same as the unmodified characteristic 401, the line could be defined by any current/voltage point (open circuit or loaded) relative to VBAT-Voff1 and still obtain the same characteristic curve. It would have been obvious to one of ordinary skill in the art at the time of this application to define the characteristic 402 with any voltage/current relative to the characteristic 401 as a matter of design choice.

As per **claim 4**, claim rejected for same reasons as claims 2,3. The impedance (slope) of both curves is equal (Fig. 4).

As per **claim 5**, Apfel (Fig. 1b) discloses the impedance (slope) is 400 ohms (approximately 320 ohms).

7. **Claims 6-9**, rejected under 35 U.S.C. 103(a) as being unpatentable over Apfel (5619567) in view of Ludeman (6665398), and further in view of Zhou (5878133).

As per **claims 6**, Apfel and Ludeman disclose claim 6 for the same reasons as the rejection of claim 1. However, they do not disclose using programmable registers to hold the variables that define the characteristic curve.

Zhou teaches a Digital Direct Current Feed control for a SLIC that uses registers to store values that define a characteristic feed curve (Col 7 lines 10-55). It would have been obvious to one of ordinary skill in the art at the time of this application to digitally implement as much of the SLIC circuitry as possible for the advantage of providing a more easily manufactured product.

As per **claim 7**, Zhou discloses a DSP.

As per **claims 8,9**, claim rejected for same reasons as claim 2-4.

8. **Claims 10-12,15**, rejected under 35 U.S.C. 103(a) as being unpatentable over Apfel (5619567) in view of Ludeman (6665398) in view of Zhou (5878133) as applied to claims 6,9,13.

As per **claim 10**, Apfel in view of Ludeman in view of Zhou uses digital registers to store values used to define a characteristic curve. Apfel uses an open circuit voltage value (VBAT-Voff1), two relative thresholds (B,E), and a target voltage (VBAT-Voff3). However they do not specify using a target open circuit voltage in defining the load line.

Since the impedance (slope) of the modified characteristic (402 in Fig. 4) is the same as the unmodified characteristic 401, the line could be defined by any current/voltage point (open circuit or loaded) relative to VBAT-Voff1 and still obtain the

same characteristic curve. It would have been obvious to one of ordinary skill in the art at the time of this application to define the characteristic 402 with any voltage/current relative to the characteristic 401 as a matter of design choice.

As per **claim 11**, claim rejected for same reasons as claims 10. The impedance (slope) of both curves is equal (Fig. 4).

As per **claims 12,15**, Apfel (Fig. 1b) discloses the impedance (slope) is 400 ohms (approximately 320 ohms).

***Response to Arguments***

1. Applicant's arguments filed 8-23-2006 have been fully considered but they are not persuasive.

As per applicant's argument (remarks page 8) that Apfel does not disclose two distinct switching thresholds, examiner notes that Ludeman is relied upon to teach the concept of two distinct loop current thresholds.

As per applicant's argument that Ludeman does not disclose the voltage hysteresis (as opposed to Apfels's disclosure), examiner notes that Apfel is relied upon to teach the voltage hysteresis. Ludeman teaches a specific concept of a switching threshold window with two distinct loop current thresholds used in a SLIC. When applied to Apfels disclosed characteristic (APFEL Fig. 4), the resulting characteristic will be in the same form as applicant's Fig. 3.

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2. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alexander Jamal whose telephone number is 571-272-7498. The examiner can normally be reached on M-F 9AM-6PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Curtis A Kuntz can be reached on 571-272-7499. The fax phone numbers for the organization where this application or proceeding is assigned are **571-273-8300** for regular communications and **571-273-8300** for After Final communications.

AJ  
October 5, 2006

  
CURTIS KUNTZ  
SUPERVISORY PATENT EXAMINER  
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